Variations in medical practice:

The problem of population need

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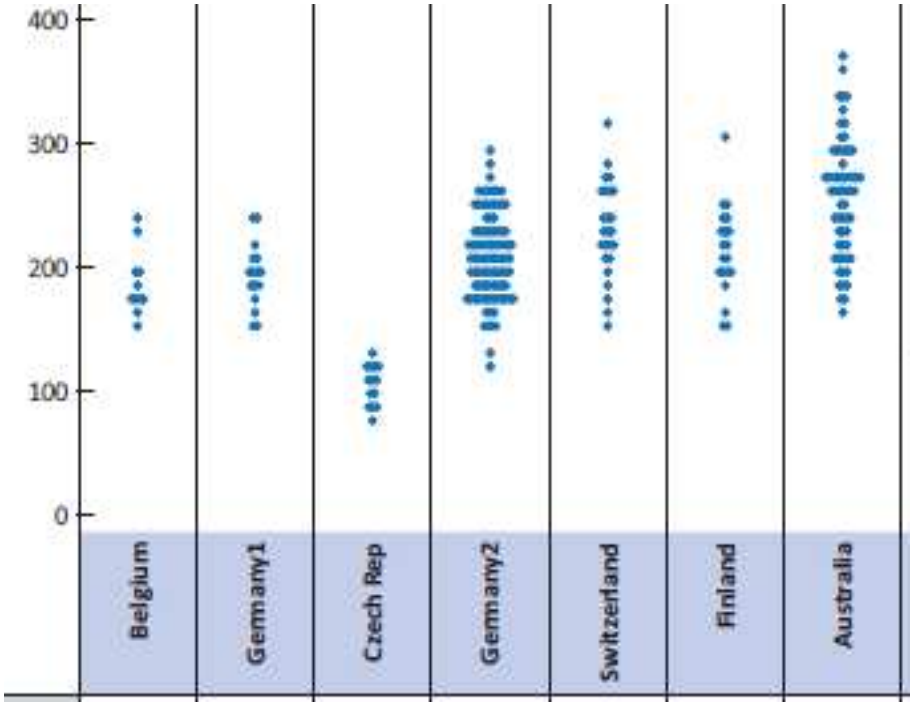
Variations: Signal of over- and underuse of services?



Rate of knee joint replacements, 2011 or last available year, per 100 000 population.
Standardised based on the OECD population over 15 years.

OECD (2014). *Geographic Variations in Health Care: What do we know and what can be done to improve health system performance?* Paris: OECD Publishing.

Problem: **missing benchmark for "needs-based"** regional variations

*"Are the regions, or institutions, or practitioners with **high rates over-providing**, or are the **low ones under-providing**, or does the **'best' rate lie somewhere in the middle (or beyond either end)**?"* (Evans, 1990 p.127)

Evans, R. (1990). The Dog in the Night-Time. In: *The Challenges of Medical Practice Variation* edited by Andersen TV and Mooney G, 117-152. London: MacMillan.

Agenda

1. **Concept of Population Capacity to Benefit (PCB)**
2. **Review of international experiences**
3. **Directions for action**

What is “need for healthcare”?

“Minimum amount of resources required to exhaust a person’s **capacity to benefit** *(Culyer, 1995 p.728)*

Culyer, A. J. (1995). Need: the idea won't do - but we still need it. *Social Science & Medicine* 40 (6):727-30.

Distinct concepts

1. Burden of disease (‘need for health’)
2. **Population capacity to benefit (‘need for health care’)**
   - **Avoidable burden of disease**
3. Diagnosis codes assigned by health professionals
4. Utilisation of services

Identical under ‘ideal’ circumstances

Task: Identify and resolve discrepancies

Regional comparisons: Two methods

	Standardisation	Population Capacity to Benefit
Guiding question	Which rate of interventions can be expected if region *k* had the same [age-, morbidity- etc] distribution as the standard population?	How many people in region *k* have a 'capacity to benefit' from intervention *i* ?
Purpose	Adjustment for causes of regional variations that are not attributable to differences in health system performance	Benchmark for the ***region-specific*** need for services
Challenges	No benchmark for the ***region-specific*** need for services	Estimation and interpretation Service use < PCB → ***Suggests*** **underuse** Service use > PCB → ***Suggests*** **overuse** Service use ≈ PCB → **Assessment of misuse:** appropriateness of care provided

PCB: Estimation

Health Technology Assessment (HTA)

1. CRITERIA OF CAPACITY TO BENEFIT

For **which groups of patients** does the intervention **improve defined health outcomes?**

Epidemiology

2. POPULATION NEEDS ASSESSMENT

What is the **incidence** of these criteria in **population *k*** over a defined **time period** (e.g. a year)?

Health services research and planning

3. COMPARISON WITH UTILISATION

Is there evidence of a **discrepancy between service utilisation and population need** for defined interventions?

Review of PCB studies: Methods

Inclusion criteria: empirical studies (indexed in Scopus, PubMed, Web of Science, Cinahl) which

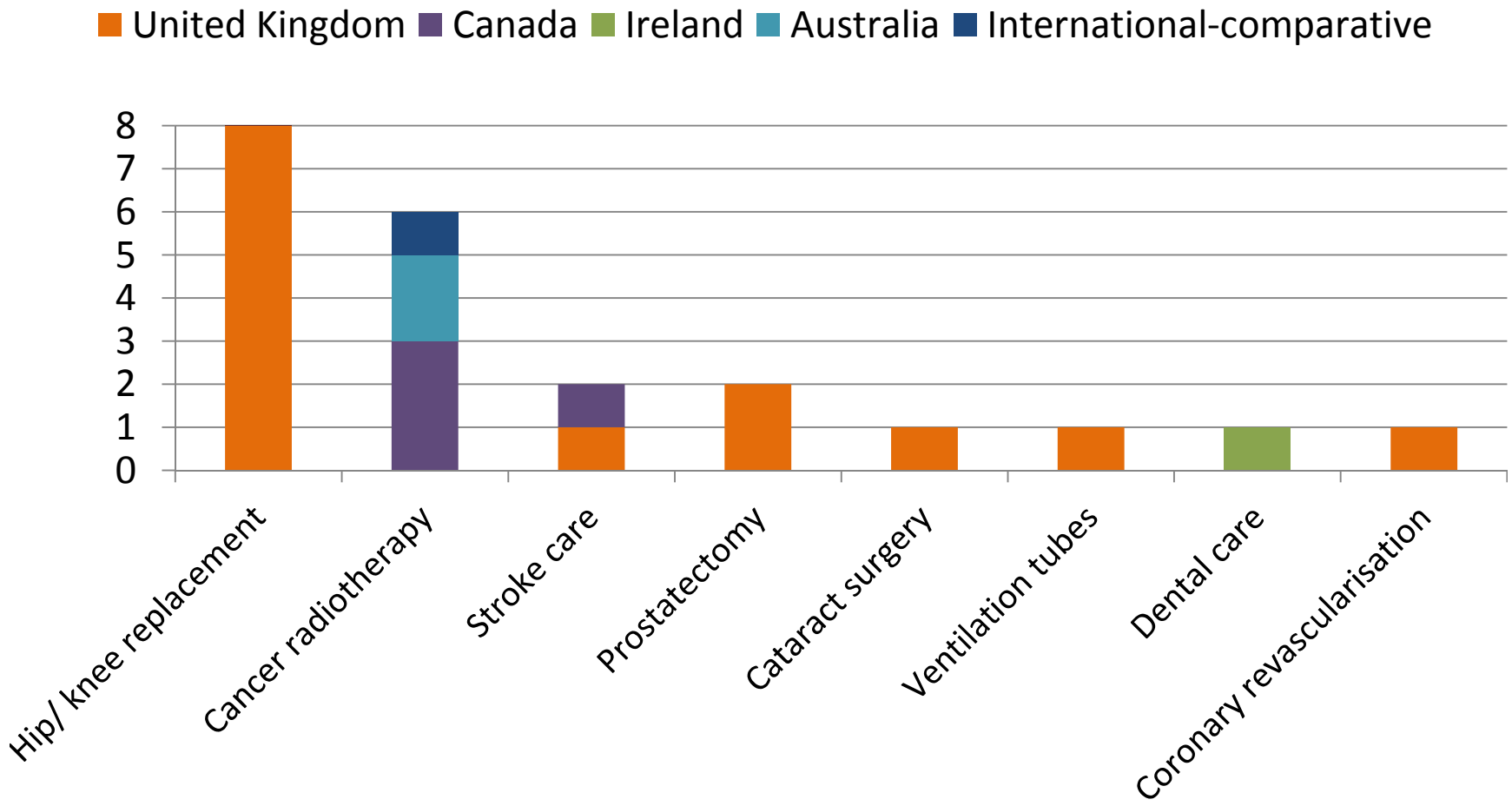
i. define **measurable criteria of capacity to benefit** from an intervention; and

ii. On this basis estimate the need for services in a population **(Population Capacity to Benefit)**

Search terms: “needs assessment” AND healthcare AND population AND criteri*; "needs assessment" AND "healthcare need“; "Population requirement”; "Healthcare requirement“; "needs assessment" AND healthcare AND population AND indication; "capacity to benefit" AND population; "healthcare needs assessment“; "right rate“; normative AND "treatment rate“; "Epidemiology of indications“

- 1113 studies in total
- 411 studies after exclusion of duplications
- **22 studies included after full-text analysis**

Focus und origin of PCB studies



1. Defining criteria of 'capacity to benefit'

- **1990s: Missing or controversial criteria of capacity to benefit**
  - Consensus Panels e.g. Sanderson *et al.* (1997)
  - Guidelines of individual medical associations e.g. Ferris *et al.* (1998)
  - New Zealand Score for hip- and knee joint replacements e.g. Frankel *et al.* (1999): but which cut-off score?
- **Recent studies: evidence-based guidance of an independent HTA Agency**
  - Schang *et al.*(2014): Standards published by the National Institute for Health and Care Excellence (NICE)

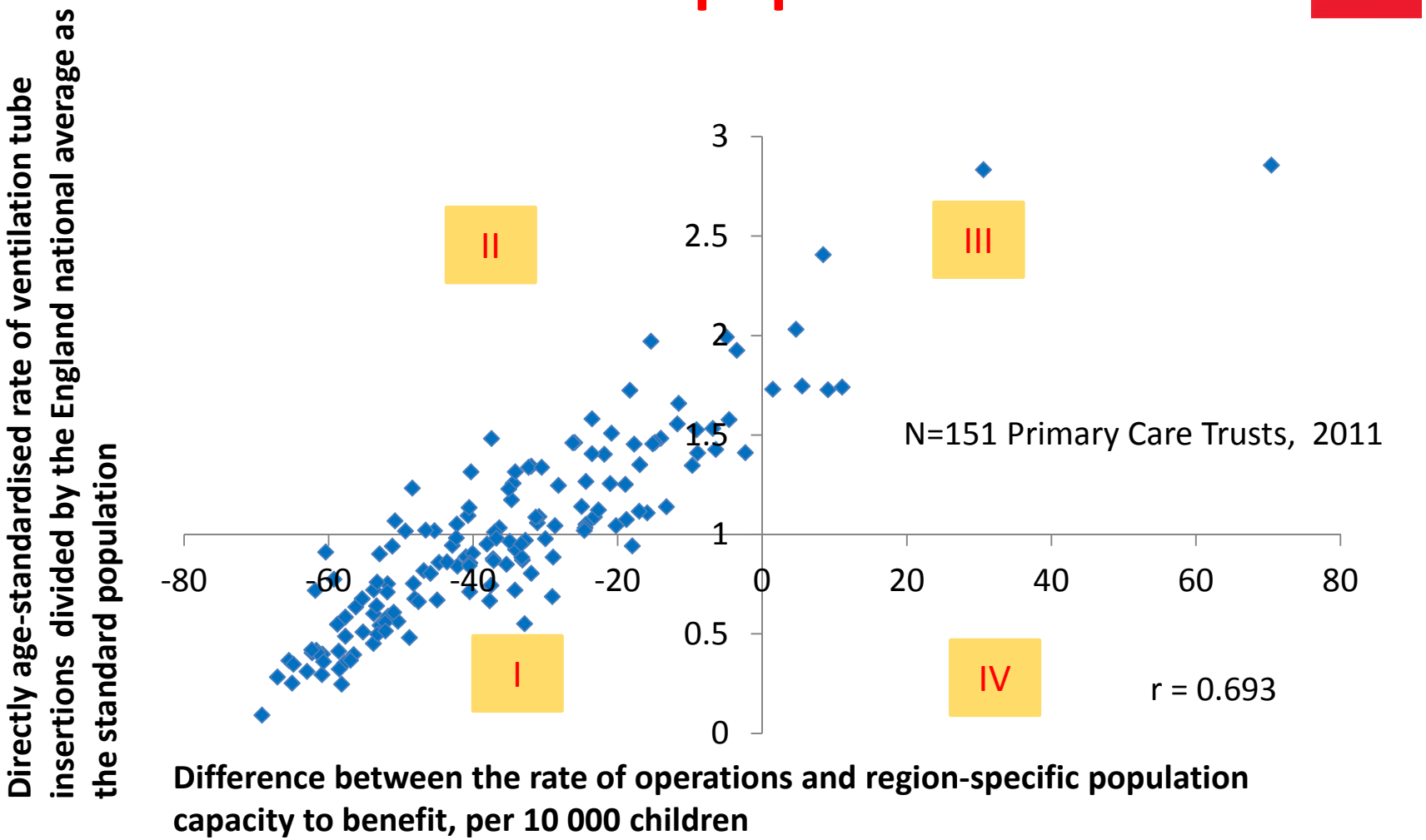
2. Population needs assessment

- **Directly within the population under study:** 7 of 22 studies
  - ➢ Validity, but not always feasible
- **Existing data from cohort or cross-sectional studies or disease registries from other populations:** 15 of 22 studies
  - ➢ 6 of 17 studies: **Sensitivity analysis** to assess the impact of data uncertainty (external validity and transferability)

3. Discrepancy analysis

- **Despite controversial criteria of capacity to benefit, indication of underuse**
  - Jüni *et al.* (2003): Given a New Zealand (NZ) Score of **55 (43) points,** estimated **population need for knee joint replacements** per year in England of about **55 800 (101 500)** operations.
    - Actual number provided: **29 300** (NHS and private sector, 1997)
- **Co-existence of overuse and underuse**
  - Hunter *et al.* (2004): **Underuse of preventive services**, **overuse of endarterectomies** for patients with stroke in Canada.
  - Schang *et al.* (2014): Clinical audits show that 2 of 3 ventilation tubes in England are **not provided in line with criteria of appropriateness.** PCB suggests simultaneous **net underuse at the population level**.

Benchmark for population need



Methods: Schang, L. *et al.* (2014). Using an epidemiological model to investigate unwarranted variation: the case of ventilation tubes for otitis media with effusion in England. *Journal of Health Services Research & Policy* 19 (4):236-44.

Conclusion: Population capacity to benefit

Approximates the concept of “need for healthcare“

- Theoretically grounded
- Operationalised using methods from HTA and Epidemiology

Tool to quantify the discrepancy between utilisation and need

- Assess the degree of “overuse” and “underuse”
- Inform service planning

Directions for action

1. Develop accurate criteria of capacity to benefit;
2. Target collection of epidemiological data;
3. Estimate PCB for resource-intensive procedures and for the entire pathway of care